

Curriculum Vitae (March 2009)

## Willem-Jan van Hoeve

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### Professional Experience

Assistant Professor of Operations Research (08/2007 – present). Tepper School of Business, Carnegie Mellon University, Pittsburgh, PA.  
Postdoctoral Associate (05/2005 – 07/2007). Department of Computer Science, Cornell University, Ithaca, NY.  
Researcher/Ph.D. student (10/2000 – 03/2005). Centrum voor Wiskunde en Informatica (CWI)<sup>1</sup>, Amsterdam, The Netherlands.  
Researcher/M.Sc. student (01/2000 – 08/2000). Paragon Decision Technology, Haarlem, The Netherlands.

### Education

**Ph.D.** Faculty of Science, University of Amsterdam, 2005  
Dissertation: *Operations Research Techniques in Constraint Programming*  
Advisor: Prof.dr. K.R. Apt  
**M.Sc.** Department of Applied Mathematics, University of Twente, 2000  
Dissertation: *Towards the Integration of Constraint Logic Programming and Mathematical Programming*  
Advisor: Prof.dr. J.J. Bisschop

### Research Interests

Combinatorial Optimization; Constraint Programming; Mathematical Programming; Integration of Constraint Programming and Mathematical Programming

### Awards

BP Junior Faculty Chair 2008–2009.  
Best paper award at the Twelfth International Conference on Principles and Practice of Constraint Programming (CP 2006) for *Revisiting The Sequence Constraint*.  
Best student paper award at the Tenth International Conference on Principles and Practice of Constraint Programming (CP 2004) for *A Hyper-Arc Consistency Algorithm for the Soft Alldifferent Constraint*.

### Publications

#### Book Chapter

1. W.-J. van Hoeve and I. Katriel. Global Constraints (invited chapter). In F. Rossi, P. van Beek, and T. Walsh (eds.), *Handbook of Constraint Programming*, chapter 6. Elsevier, 2006.

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<sup>1</sup>The national research institute for mathematics and computer science in The Netherlands.

### Journal Publications

2. W.-J. van Hoeve, G. Pesant, L.-M. Rousseau, and A. Sabharwal. New Filtering Algorithms for Combinations of Among Constraints. *Constraints*, forthcoming, 2009.
3. W.-J. van Hoeve, G. Pesant, and L.-M. Rousseau. On Global Warming: Flow-Based Soft Global Constraints. *Journal of Heuristics* 12(4–5), pp. 347–373, 2006.
4. W.-J. van Hoeve. Exploiting Semidefinite Relaxations in Constraint Programming. *Computers & Operations Research* 33(10), pp. 2787–2804, 2006.

### Rigorously Refereed Conference Publications<sup>2</sup>

5. Y. Malitsky, M. Sellmann, and W.-J. van Hoeve. Length-Lex Bounds Consistency for Knapsack Constraints. In *Proceedings of the 14th International Conference on Principles and Practice of Constraint Programming (CP 2008)*, *Lecture Notes in Computer Science* 5202, pp. 266–281. Springer, 2008.
6. C.P. Gomes, W.-J. van Hoeve, and A. Sabharwal. Connections in Networks: A Hybrid Approach. In *Proceedings of the Fifth International Conference on Integration of AI and OR Techniques in Constraint Programming for Combinatorial Optimization Problems (CP-AI-OR 2008)*, *Lecture Notes in Computer Science* 5015, pp. 303–307. Springer, 2008.
7. W.-J. van Hoeve and A. Sabharwal. Filtering Atmost1 on Pairs of Set Variables. In *Proceedings of the Fifth International Conference on Integration of AI and OR Techniques in Constraint Programming for Combinatorial Optimization Problems (CP-AI-OR 2008)*, *Lecture Notes in Computer Science* 5015, pp. 382–386. Springer, 2008.
8. C.P. Gomes, W.-J. van Hoeve, A. Sabharwal, and B. Selman. Counting CSP Solutions Using Generalized XOR Constraints. In *Proceedings of the Twenty-Second Conference on Artificial Intelligence and the Nineteenth Conference on Innovative Applications of Artificial Intelligence (AAAI/IAAI 2007)*, pp. 204–209. AAAI Press, 2007.
9. W.-J. van Hoeve, C.P. Gomes, M. Lombardi, and B. Selman. Optimal Multi-Agent Scheduling with Constraint Programming. In *Proceedings of the Twenty-Second Conference on Artificial Intelligence and the Nineteenth Conference on Innovative Applications of Artificial Intelligence (AAAI/IAAI 2007)*, pp. 1813–1818. AAAI Press, 2007.
10. J. Conrad, C.P. Gomes, W.-J. van Hoeve, A. Sabharwal, and J. Suter. Connections in Networks: Hardness of Feasibility versus Optimality. In *Proceedings of the Fourth International Conference on Integration of AI and OR Techniques in Constraint Programming for Combinatorial Optimization Problems (CP-AI-OR 2007)*, volume 4510 of *Lecture Notes in Computer Science*, pp. 16–28. Springer, 2007.
11. W.-J. van Hoeve, G. Pesant, L.-M. Rousseau, and A. Sabharwal. Revisiting the Sequence Constraint. In *Proceedings of the Twelfth International Conference on Principles and Practice of Constraint Programming (CP 2006)*, volume 4204 of *Lecture Notes in Computer Science*, pp. 620–634. Springer, 2006.
12. W.-J. van Hoeve and J.-C. Régin. Open Constraints in a Closed World. In *Proceedings of the Third International Conference on Integration of AI and OR Techniques in Constraint Programming for Combinatorial Optimization Problems (CP-AI-OR 2006)*, volume 3990 of *Lecture Notes in Computer Science*, pp. 244–257. Springer, 2006.
13. C.P. Gomes, W.-J. van Hoeve, and L. Leahu. The Power of Semidefinite Programming Relaxations for MAX-SAT. In *Proceedings of the Third International Conference on Integration of AI and OR Techniques in Constraint Programming for Combinatorial Optimization Problems (CP-AI-OR 2006)*, volume 3990 of *Lecture Notes in Computer Science*, pp. 104–118. Springer, 2006.

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<sup>2</sup>Note that in computer science, rigorously refereed conference proceedings are generally the premier publication venue. The acceptance rate of these conferences is less than 30%.

14. W.-J. van Hoeve. A Hyper-Arc Consistency Algorithm for the Soft Alldifferent Constraint. In *Proceedings of the Tenth International Conference on Principles and Practice of Constraint Programming (CP 2004)*, volume 3258 of *Lecture Notes in Computer Science*, pp. 679–689. Springer, 2004.
15. W.-J. van Hoeve and M. Milano. Postponing Branching Decisions. In *Proceedings of the 16th European Conference on Artificial Intelligence (ECAI 2004)*, pp. 1105–1106. IOS Press, 2004.
16. W.-J. van Hoeve. A Hybrid Constraint Programming and Semidefinite Programming Approach for the Stable Set Problem. In *Proceedings of the Ninth International Conference on Principles and Practice of Constraint Programming (CP 2003)*, volume 2833 of *Lecture Notes in Computer Science*, pp. 407–421. Springer, 2003.
17. M. Milano and W.-J. van Hoeve. Reduced Cost-Based Ranking for Generating Promising Subproblems. In *Proceedings of the Eighth International Conference on Principles and Practice of Constraint Programming (CP 2002)*, volume 2470 of *Lecture Notes in Computer Science*, pp. 1–16. Springer, 2002.

#### Other Publications

18. W.-J. van Hoeve, and A. Sabharwal. Bounds Consistency Filtering for Pair-Atmost1. *Under review (journal submission)*, 2008.
19. W.-J. van Hoeve and A. Sabharwal. Two Set-Constraints for Modeling and Efficiency. In *Proceedings of the 6th International Workshop on Constraint Modelling and Reformulation (ModRef 2007)*, 2007.
20. C.P. Gomes, W.-J. van Hoeve, and B. Selman. Constraint Programming for Distributed Planning and Scheduling. In *Proceedings of the AAAI 2006 Spring Symposium on Distributed Plan and Schedule Management*, 2006.
21. W.-J. van Hoeve, G. Pesant, and L.-M. Rousseau. On Global Warming (Softening Global Constraints). In *Proceedings of the 6th International Workshop on Preferences and Soft Constraints*, 2004.
22. W.-J. van Hoeve. A Hybrid Constraint Programming and Semidefinite Programming Approach for the Stable Set Problem. In *Proceedings of the Fifth International Workshop on Integration of AI and OR Techniques in Constraint Programming for Combinatorial Optimization Problems (CP-AI-OR 2003)*, pp. 3–16, 2003.
23. M. Milano and W.-J. van Hoeve. Reduced Cost-Based Ranking for Generating Promising Subproblems. In *Proceedings of the Joint ERCIM/CologNet Workshop on Constraint Solving and Constraint Logic Programming*, pp. 7–22, 2002.
24. W.-J. van Hoeve. The Alldifferent Constraint: A Survey. In *Proceedings of the Sixth Annual Workshop of the ERCIM Working Group on Constraints*, 2001.
25. V.-D. Cung, F. Roupin, and W.-J. van Hoeve. A parallel Branch-and-Bound algorithm using a semi-definite programming relaxation for the maximum independent set. In *Proceedings of ROADEF*, 2000.

#### Theses

26. W.-J. van Hoeve. Operations Research Techniques in Constraint Programming. Ph.D. Thesis, University of Amsterdam, 2005. ISBN 90-6196-529-2
27. W.-J. van Hoeve. Towards the Integration of Constraint Logic Programming and Mathematical Programming. M.Sc. Thesis, University of Twente, 2000.

### Technical Reports

28. G. Dooms, L. Mercier, P. Van Hentenryck, W.-J. van Hoeve and L. Michel. Length-Lex Open Constraints. *Technical Report CS-07-09*, Brown University, 2007.
29. W.-J. van Hoeve and M. Milano. Decomposition Based Search - A theoretical and experimental evaluation. *Technical Report LIA00203*, University of Bologna, 2003.

### Selected Talks

- Domain Filtering Algorithms in Constraint Programming. *ACO Seminar*, Carnegie Mellon University, 2008.
- Counting CSP Solutions using Generalized XOR Constraints. *INFORMS Annual Meeting*, 2008.
- Optimal Scheduling of Collaborative Agents. *Artificial Intelligence Research Group Seminar*, Harvard University, 2007; *Department of Computer Science Seminar*, Brown University, 2007; *Intelligence Seminar*, Carnegie Mellon University, 2007; *Tenth INFORMS Computing Society Conference*, 2007.
- Algorithms in Constraint Programming: The Sequence Constraint. *Colloquium speaker*, Department of Computer Science, Brown University, 2006; *INFORMS Annual Meeting*, 2007.
- Open Constraints in a Closed World. *INFORMS Annual Meeting*, 2007.
- Semidefinite Relaxations in Constraint Programming. *INFORMS Annual Meeting*, 2006.
- Constraint Programming: Algorithms and Applications. *Artificial Intelligence Seminar*, Cornell University, 2006.
- The Power of Semidefinite Programming Relaxations for MAXSAT. *21st European Conference on Operational Research (EURO XXI)*, 2006.
- Constraint Programming for Distributed Planning and Scheduling. *Séminaire Génie Industrielle*, University of Montreal, 2006.
- Postponing Branching Decisions. *INFORMS Annual Meeting*, 2005; *Seminar*, University of Nantes, 2004.
- An Efficient Propagation Algorithm for the Soft-Alldifferent Constraint. *INFORMS Annual Meeting*, 2005.
- Exploiting Semidefinite Relaxations in Constraint Programming. *CORS/INFORMS Joint International Meeting*, 2004; *Seminar*, University of Bologna, 2003.
- Reduced cost-based ranking for generating promising subproblems. *Seminar*, University of Bologna, 2002.

### Professional Activities

- Elected steering committee member of the Constraint Programming Society of North America (office of secretary/treasurer, term 2007–2009).
- Program co-chair and co-organizer of the International Conference on Integration of Artificial Intelligence and Operations Research Techniques in Constraint Programming for Combinatorial Optimization Problems (CP-AI-OR 2009).
- Editor of Constraint Programming Letters.
- External reviewer for several journals, including the INFORMS Journal on Computing, Artificial Intelligence, Constraints, the Journal of Artificial Intelligence Research, the Journal of Computer and System Sciences, the Journal of Heuristics, Computers and Operations Research, Information Systems and Operational Research, Software: Practice and Experience, and AI Communications.
- Co-chair of the Student Abstract and Poster Program for the National Conference on Artificial Intelligence (AAAI 2008).
- Program committee member of the National Conference on Artificial Intelligence (AAAI 2006, 2007, 2008).
- Session organizer at the INFORMS Annual Meeting, 2008.
- Program committee member of the European Conference on Artificial Intelligence (ECAI 2008).

Program committee member of the International Conference on Integration of Artificial Intelligence and Operations Research Techniques in Constraint Programming for Combinatorial Optimization Problems (CP-AI-OR 2007, 2008).

Publicity co-chair of the Second International Conference on Integration of Artificial Intelligence and Operations Research Techniques in Constraint Programming for Combinatorial Optimization Problems (CP-AI-OR 2005).

Program committee member of the International Conference on Principles and Practice of Constraint Programming (CP 2007).

Organizing committee member of the Doctoral Program of the International Conference on Principles and Practice of Constraint Programming (CP 2007).

Mentor in the Doctoral Program of the International Conference on Principles and Practice of Constraint Programming (CP 2006).

Program committee member of the International Workshop on Constraint Propagation and Implementation (2004, 2005, 2006).

Program committee member of the International Workshop on Preferences and Soft Constraints (2006).

Referee for several conferences and workshops, including the International Conference on Principles and Practice of Constraint Programming (CP), the International Conference on Logic Programming (ICLP), the International Conference on Integration of Artificial Intelligence and Operations Research Techniques in Constraint Programming for Combinatorial Optimization Problems (CP-AI-OR), the National Conference on Artificial Intelligence (AAAI), the International Joint Conferences on Artificial Intelligence (IJCAI), the European Conference on Artificial Intelligence (ECAI), the International Symposium on Artificial Intelligence and Mathematics (ISAIM), and the workshop of the ERCIM Working Group on Constraints.

## Research Visits

Harvard University (2007), visiting Prof.dr. B.J. Grosz

Brown University (2006, 2007), visiting Prof.dr. P. Van Hentenryck

University of Montreal (2004, 2006), visiting Prof.dr. G. Pesant and Prof.dr. L.-M. Rousseau

University of Nantes (2004), visiting Prof.dr. E. Monfroy

National University of Singapore (2003), visiting Prof.dr. K.R. Apt

University of Bologna (2001, 2002, 2003, 2004), visiting Prof.dr. M. Milano

## Teaching Experience

Optimization Models for Operations. MBA level (elective), Spring 2009.

Optimization and Decision Making. MBA level (core), Fall 2008.

Optimization Models for Logistics. MBA level (elective), Spring 2008.

Mathematical Models for Consulting. Undergraduate level, Spring 2008.

Optimization, Logic, and Constraint Satisfaction. Ph.D. level, Fall 2007.

Lecturer at the *Second International Summer School of the Association for Constraint Programming*, 2006. The topic of my lectures was “soft global constraints”.

Organizer of, and lecturer at, the *IISI Tutorial Series on Design and Study of Intelligent Systems*, 2005.<sup>3</sup> My tutorial “Constraint Reasoning in Intelligent Systems” consisted of four lectures: Combinatorial problems, modeling, solving, and applications.

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<sup>3</sup>IISI stands for Intelligent Information Systems Institute, a research institute at Cornell University.